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EXAMINER	
FAN, HUA	
ART UNIT	**PAPER NUMBER**
2456	

NOTIFICATION DATE	DELIVERY MODE
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary	Application No.	Applicant(s)	
	10/797,200	BANERJEE ET AL.	
	Examiner	Art Unit	
	HUA FAN	2456	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *02 June 2008 and 08 December 2008*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,4-21,24-31,34 and 35* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,4-21,24-31,34 and 35* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

1. In view of the appeal brief filed on 12/8/2008, PROSECUTION IS HEREBY REOPENED. *New grounds of rejection are* set forth below.

To avoid abandonment of the application, appellant must exercise one of the following two options:

(1) file a reply under 37 CFR 1.111 (if this Office action is non-final) or a reply under 37 CFR 1.113 (if this Office action is final); or,

(2) initiate a new appeal by filing a notice of appeal under 37 CFR 41.31 followed by an appeal brief under 37 CFR 41.37. The previously paid notice of appeal fee and appeal brief fee can be applied to the new appeal. If, however, the appeal fees set forth in 37 CFR 41.20 have been increased since they were previously paid, then appellant must pay the difference between the increased fees and the amount previously paid.

A Supervisory Patent Examiner (SPE) has approved of reopening prosecution by signing below:

/Bunjob Jaroenchonwanit/

Supervisory Patent Examiner, Art Unit 2456.

2. This office action is in response to Amendments/Remarks filed on 6/2/2008 and the supplemental 131 affidavit contained in the Appeal Brief filed 12/8/2008. Claims 1, 4-21, 24-31, and 34-35 are pending. Claims 1, 21, 24, 31, and 35 have been amended. Claim 2-3, 22-23, 32-33, and 36 have been cancelled.

Response to Amendment

3. The affidavit contained in the Appeal Brief filed on 12/8/2008 under 37 CFR 1.131 has corrected the deficiency in the prior version filed 6/2/2008 and is now sufficient to overcome the Xu (HPL314R1) reference cited in the prior Office action. The corresponding rejections that cited Xu (HPL 314R1) are therefore withdrawn.

Claim Rejections - 35 USC § 101

4. 35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

Claims 31 and 34-35 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter as follows. Claim 31 and 34-35 are drawn to functional descriptive material recorded on a computer-readable medium. Normally, the claim would be statutory. However, the specification, at paragraph [0123], lines 10-12 of PGPub, defines the claimed computer readable medium as encompassing statutory media such as a storage devices as well as non-statutory subject mater such as a "signal".

> A "signal" embodying functional descriptive material is neither a process nor a product (i.e., a tangible "thing") and therefore does not fall within one of the four statutory classes of § 101. Rather, "signal" is a form of energy, in the absence of any physical structure or tangible material.

Because the full scope of the claim as properly read in light of the disclosure encompasses non-statutory subject matter, the claim as a whole is non-statutory.

The examiner suggests amending the claim to *include* the disclosed tangible computer readable storage media, while at the same time *excluding* the intangible transitory media such as signals, carrier waves, etc. Any amendment to the claim should be commensurate with its corresponding disclosure.

Claim Rejections - 35 USC § 102

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

6. Claim 24 is rejected under 35 U.S.C. 102(b) as being anticipated by Novaes et al. (US Publication 2003/0012132).

As to claim 24, Novaes et al discloses a node in a multicast tree, the node comprising:

means for detecting a degradation of quality of service associated with a service being received at the node ([0071], "p is assigned as point to point QoS threshold...c is assigned as the current point to point reception QoS…queried as to whether c is less than p"); and

means for transmitting a complaint to **a** parent node of the node in the multicast tree, the complaint indicating a degradation of quality of service at the child node ([0071], "p is assigned as point to point QoS threshold...c is assigned as the current point to point reception QoS…queried as to whether c is less than p. If yes, a new node placement is requested from the publisher" where the new node placement request from the subscriber node to the publisher is equivalent to the complaint since publisher node is parent to all subscriber nodes), wherein the multicast tree includes a service path comprising a source node, the parent node and the node,

and the parent node is an immediate parent node to the node such that data for a service is transmitted in the service path directly from the parent node to the node (figure 1; [0041]-[0042], "publisher node" is a source node and also the parent node to the node in the SAM tree when "the node" is an immediate child of the publisher node. It is to be noted that the claim language does not require the source node and the parent node are separate nodes on the service path, therefore the examiner interprets a node can server as both a source node and the parent node).

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

8. Claims 1, 4-5, 10, 12, 25-26, 31 and 34 rejected under 35 U.S.C. 103(a) as being unpatentable over Novaes et al.(US Publication 2003/0012132), in view of O'Neal et al (US publication 2003/0051051).

As to claim 1, Novaes et al. discloses a method of detecting a degradation of quality of service in a multicast tree in a multicast network, the method comprising:

detecting at a child node in the multicast tree a degradation of quality of service associated with a service being received at the child node ([0071], lines 10-17, when q=2, subscriber node detects a degradation of quality of service when it detects c is less than p),

but does not expressly disclose determining whether the degradation of quality of service is resulting from a child-parent link or an upstream link to the child-parent link in the multicast tree; selecting a new parent node for the child node in response to detecting the degradation of

quality of service is resulting from the child-parent link; and selecting a new parent node for a child node incident to the upstream link in response to detecting the degradation of quality of service is resulting from the upstream link. O'Neal et al discloses determining whether the degradation of quality of service is resulting from a child-parent link or an upstream link to the child-parent link in the multicast tree (figure 31, component 313, "Is there a communication problem between the grandparent and its child node", if the answer is yes, it means upstream link is a problem; if the answer is no, it means parent-child link has problem); selecting a new parent node for the child node in response to detecting the degradation of quality of service is resulting from the child-parent link (figure 31, component 315, "Grandparent forces disconnection of complaining grandchild"; [0217], "the grandparent sends a disconnect signal to the complaining child node (sending it back to the server to begin the connection process again"); figure 17, "instruct new user node to connect directly to server", "prospective parent user node"); and selecting a new parent node for a child node incident to the upstream link in response to detecting the degradation of quality of service is resulting from the upstream link (figure 31, "Grandparent forces disconnection of its child node about which it received complaint", i.e., the parent node is disconnected from the tree, "Grandparent sends propagation signal to its grandchild nodes", i.e., the grandchild node is reconnected to the tree by selecting a new parent, as shown in figure 17).

At the time of invention, it would have been obvious to a person of ordinary skilled in the art to combine the teachings disclosed by Novaes et al, with the teachings disclosed by O'Neal et al regarding determining whether the degradation of quality of service is resulting from a child-parent link or an upstream link to the child-parent link in the multicast tree; selecting a new

parent node for the child node in response to detecting the degradation of quality of service is resulting from the child-parent link; and selecting a new parent node for a child node incident to the upstream link in response to detecting the degradation of quality of service is resulting from the upstream link. The suggestion/motivation of the combination would have been to solve the problem of a node intending to remain in the network while there is a failure of communication (O'Neal et al, [0211]).

As to claim 4, Novaes-O'Neal discloses a method of transmitting a complaint to the parent node, the complaint indicating a degradation of quality of service at the child node (Novaes, [0071], the child node will send request to the publisher node asking for re-insertion when QoS is detected to be below threshold, wherein the publisher node is parent node to all subscriber nodes);

receiving a list of a set of candidate nodes in response to the degradation of quality of service resulting from the child-parent link; and selecting one of the candidate nodes as a new parent node for the child node (Novaes, [0071], the publisher node does the job of receiving a list of a set of candidate node and select a new parent for the child node; Novaes, [0065], "detect that new routing paths are available and to make changes in the SAM tree accordingly. The publisher node is able to detect when a better position for a given subscriber becomes available by re-computing a node placement operation" indicates the list of candidates is available for the publisher node to select a new parent from. O'Neal, figure 31, component 315, "Grandparent forces disconnection of complaining grandchild"; [0217], "sending it back to the server to begin the connection process again"; figure 17 and 19 for receiving a list of prospective parents and selecting a new parent from the list).

As to claim 5, Novaes-O'Neal discloses a method of constructing a new service path in the multicast tree including the child node and the new parent node (Novaes, [0065], lines 12-15. re-inserting the child node into the SAM tree after disconnected from the old parent node, constructs a new service path in the multicast tree including the child node and the new parent node. O'Neal, figure 31, component 315, "Grandparent forces disconnection of complaining grandchild"; [0217], "sending it back to the server to begin the connection process again"; figure 17 and 19 for receiving a list of prospective parents and selecting a new parent from the list).

As to claim 10, Novaes-O'Neal discloses detecting at a child node a degradation of quality of service comprises detecting a measured quality of service characteristic associated with the received service falling below a predetermined threshold (Novaes, [0071], lines 10-17, c<p).

As to claim 12, Novaes-O'Neal discloses quality of service includes at least one of a metric associated with processing data at a node receiving the service and a metric associated with transmitting data for the service between nodes in the multicast tree (Novaes, [0071], lines 10-17, point-to-point QoS).

As to claim 25, Novaes-O'Neal discloses receiving a list of a set of candidate nodes in response to the degradation of quality of service resulting from a child-parent link (see similar rejection to claim 4); and means for selecting one of the candidate nodes as a new parent node for the child node (see similar rejection to claim 4).

As to claim 26, Novaes-O'Neal discloses means for receiving notification of an occurrence of a predetermined condition; and means for determining whether to reconfigure the multicast tree in response to the occurrence of the predetermined condition (Novaes, [0071],

lines 10-17, a predetermined condition is c<p, and determining by sending a re-placement request to the publisher node)

Claim 31 is a computer software claim corresponding to the method claim 1, therefore it has been analyzed and rejected based upon the method claim 1.

As to claim 34, Novaes-O'Neal discloses computer software embedded on a computer readable medium, the computer software comprising instructions performing:

transmitting a complaint to the parent node, the complaint indicating a degradation of quality of service at the child node (Novaes, [0071], lines 10-17, child node sends request for being re-inserted into SAM tree to the publisher node upon detecting QoS degradation),

receiving a list of a set of candidate nodes in response to the degradation of quality of service resulting from the child-parent link (see similar rejection to claim 4); and

selecting one of the candidate nodes as a new parent node for the child node (see similar rejection to claim 4). .

9. Claim 6 rejected under 35 U.S.C. 103(a) as being unpatentable over Novaes et al., in view of O'Neal., as applied to claim 1 above, and further in view of "Application Level Hand-off Support for Mobile Media Transcoding Sessions" by Roy et al..

As to claim 6, Novaes-O'Neal does not teach establishing a connection to the new parent node while maintaining a connection to the parent node, synchronizing data received from the parent node and the new parent node, or terminating the connection to the parent node. Roy et al. discloses above functions (hand-off process, page 97, section 4, lines 24-31).

At the time of invention, it would have been obvious to a person of ordinary skilled in the art to combine the method disclosed by Novaes-O'Neal, with the hand-off process disclosed by

Roy et al.. The suggestion/motivation would have been to solve the problem when the movement of a client causes the current transcoding server to be inefficient for the client's new location (Roy et al., page 97, section 4, lines 1-4).

10. Claim 7-8 and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Novaes et al., in view of O'Neal et al, as applied to claim 1 above, and further in view of "Building Topology-Aware Overlays using Global Soft-state" (HPL-2002-281) by Xu et al..

As to claim 7, Novaes-O'Neal does not expressly disclose measuring distances to each of the candidate nodes; determining a metric associated with the quality of service and each candidate node; and selecting one of the candidate nodes that is closest to the child node and that is operable to satisfy at least one quality of service characteristic . HPL-2002-281 discloses measuring distances to each of the candidate nodes; determining a metric associated with the quality of service and each candidate node; and selecting one of the candidate nodes that is closest to the child node and that is operable to satisfy at least one quality of service characteristic (section 1, lines 67-70; section 6, lines 1-3).

At the time of invention, it would have been obvious to a person of ordinary skilled in the art to combine the method disclosed by Novaes-O'Neal., with the method of selecting candidate nodes disclosed by HPL-2002-281. The suggestion/motivation would have been to take advantage of the condition of the underlying physical network and effectively utilizes physical proximity information (HPL-2002-281, section 1, lines 5-9), and to achieve both efficiency and accuracy (HPL-2002-281, section 1, line 70).

As to claim 8, Novaes-O'Neal does not expressly disclose each of the candidate nodes is physically close to the child node. HPL-2002-281 discloses each of the candidate nodes is physically close to the child node (section 1, lines 76-82).

At the time of invention, it would have been obvious to a person of ordinary skilled in the art to combine the method disclosed by Novaes-O'Neal., with the method disclosed by HPL-2002-281. The suggestion/motivation would have been to effectively take advantage of the conditions of the underlying physical network (HPL-2002-281, section 1, lines 5-6).

As to claim 13, Novaes et al discloses determining at the parent node whether quality of service associated with the service is degraded; transmitting a complaint to the parent node's parent node in the multicast tree indicating a degradation of quality of service at the parent node in response to determining at the parent node that the quality of service is degraded ([0071], lines 10-17). Novaes-O'Neal, however, does not teach requesting a list of a set of candidate nodes from a global information table in response to determining at the parent node that the quality of service is not degraded, wherein each of the candidate nodes is operable to provide the service to the child node and is physically close to the child node. HPL-2002-281 instead discloses a mechanism to provide above functions (section 1, lines 67-70; section 6, lines 1-3).

At the time of invention, it would have been obvious to a person of ordinary skilled in the art to combine the method disclosed by Novaes-O'Neal, with the method of selecting candidate nodes disclosed by HPL-2002-281. See similar motivation in claim 7 rejection.

11. Claims 21 and 35 are rejected under 35 U.S.C. 103(a) as being unpatentable over Novaes et al, as applied to claim 24, and further in view of Geddes (US patent 6751661), and "Building Topology-Aware Overlays using Global Soft-state" (HPL-2002-281) by Xu et al..

As to claim 21, Novaes et al discloses determining whether to reconfigure a multicast tree in an application layer multicast network, the method comprising:

detecting an occurrence of a predetermined condition in the application multicast network ([0071], lines 10-17, the predetermined condition is point-to-point QoS c lower than the point-to-point QoS threshold p);

determining whether to reconfigure the multicast tree in response to detecting the occurrence of the predetermined condition ([0071], lines 10-17, requesting a new node replacement is in response to detecting the predetermined condition of c<p).

Novaes et al, however, does not expressly disclose determining whether reconfiguring the multicast tree improves quality of service for a node in the multicast tree; and reconfiguring the multicast tree in response to determining that reconfiguring the multicast tree improves quality of service for a node in the multicast tree, and the predetermined condition is stored in a global information table stored in distributed hash table nodes in the network.

Geddes discloses determining whether reconfiguring the route improves quality of service (col. 13, lines 21-40, reconfiguring the route according to selected route plan which improves the quality of service); and reconfiguring the route in response to determining that reconfiguring the route improves quality of service (col. 13, lines 21-40, reconfiguring the route according to selected route plan which improves the quality of service).

At the time of invention, it would have been obvious to a person of ordinary skilled in the art to combine the teachings disclosed by Novaes et al, with the teachings disclosed by Geddes regarding determining whether reconfiguring the route improves quality of service; and reconfiguring the route in response to determining that reconfiguring the route improves quality

of service. The suggestion/motivation of the combination would have been to rerouting the traffic to improve the Quality of Service (Geddes, col. 13, lines 21-40).

HPL-2002-281 discloses the predetermined QoS condition can be stored in a global information table in distributed hash table nodes in the network (section 1, lines 73-82; section 6, lines 1-3).

At the time of invention, it would have been obvious to a person of ordinary skilled in the art to combine the method disclosed by Novaes-Geddes with the method disclosed by HPL-2002-281. The suggestion/motivation would have been to provide a timely fix therefore maintain efficient routes (HPL-2002-281, section 1, lines 55-60).

As to claim 35, see similar rejection to claim 21.

12. Claim 11 rejected under 35 U.S.C. 103(a) as being unpatentable over Novaes et al., in view of O'Neal et al., as applied to claim 1 above, and further in view of US Pub 2005/0157660 by Mandato et al.

As to claim 11, Novaes et al discloses detecting at a child node a degradation of quality of service ([0071], lines 10-17); however, it does not expressly disclose the degradation of quality of service is perceived by users. Mandato et al., instead expressly discloses quality of services include user perceived quality of service ([0103]).

At the time of invention, it would have been obvious to a person of ordinary skilled in the art to combine the method disclosed by Novaes et al. as modified by O'Neal., with the method of selecting candidate nodes disclosed by Mandato et al.. The suggestion/motivation of the combination would have been to provide current and intended network utilization, for example,

the expected destinations and traffic volumes in terms of application-level QoS contracts (Mandato et al., [0065]).

13. Claim 9 rejected under 35 U.S.C. 103(a) as being unpatentable over Novaes et al., in view of O'Neal et al, as applied to claim 1 above, and further in view of US Pub 2004/0156384 to Rune at al..

As to claim 9, Novaes-O'Neal does not expressly disclose determining whether the complaint timed out and retransmitting the request when timeout occurs. Rune at al. discloses determining whether the complaint timed out and retransmitting the request when timeout occurs ([0090], lines 1-6).

At the time of invention, it would have been obvious to a person of ordinary skilled in the art to combine the teaching of Novaes-O'Neal with the teaching of Rune et al. regarding retransmitting the request when timeout occurs. The rational would have been to increase the reliability of the protocol, as exemplified in Rune et al.

14. Claims 14 is rejected under 35 U.S.C. 103(a) as being unpatentable over Novaes et al., as applied to claim 24, and further in view of by Banerjee et al ("Construction of an Efficient Overlay Multicast Infrastructure for Real-time Application").

As to claim 14, Novaes et al discloses determining location of degradation of quality of service in a multicast tree in an application layer multicast network, the method comprising:

receiving a complaint from a child node at a parent node in the multicast tree, the complaint indicating a degradation of quality of service of a service being received at the child node ([0071], lines 10-17, once degradation of QoS is detected, the node sends a complaint to the publisher node (root node) which is a parent node to all subscriber nodes in the SAM tree); and

determining whether a cause of the degradation of quality of service is located in an upstream link or is located at a child-parent link ([0071], lines 10-17; [0063], lines 1-15, the publisher node determines where the cause/complaint of degradation of QoS comes from, whether from a child-parent link or an upstream link, depending on which node is sending the complaint. It is to be noted that the claimed language used "**a** parent-child link" and "**an** upstream link" therefore they can be interpreted broadly as any upstream link and parent-child link in the multicast tree).

Novaes et al disclose a multicast tree (SAM tree as shown in figure 1), but does not expressly disclose an application-layer. Banerjee et al. discloses a method of constructing and adapting an application level multicast tree based on quality of service (page3, left col., lines 24-32).

At the time of invention, it would have been obvious to a person of ordinary skilled in the art to combine the method disclosed by Novaes et al. regarding detecting a degradation of quality of service in a multicast tree in a multicast network with constructing and adapting an application level multicast tree based on quality of service, disclosed by Banerjee et al.. The suggestion/motivation would have been using application-level multicasting architecture relieves the access bottleneck at the server(s) (Banerjee et al., page 1, right col., lines 18-20).

15. Claims 27, 15-18 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Novaes et al., in view of Banerjee et al, as applied to claim 14 above, and further in view of Xu et al. ("Building Topology-Aware Overlays using Global Soft-state" (HPL-2002-281)).

As to claim 27, Novaes et al discloses a parent node connected to a child node in a multicast tree, the parent node comprising:

means for receiving a complaint from the child node, the complaint indicating a degradation of quality of service of a service being received at the child node ([0068], "if q=2 the node requires parent node monitoring and QoS monitoring only when it detects a degradation in the reception of messages that originate at the publisher node". This implies when q=2, at the time the parent of the node receives a verification message from the child node using the parent node monitoring mechanism, the message indicates a degradation in the reception of messages at the child node is detected, because when q=2, the parent node monitoring is required only when the child node detects a degradation in service as indicated in [0068]; see [0071] for how to detect degradation of service at the child node); and

means for determining whether quality of service associated with the service is degraded at the parent node (it is to be noted that this limitation does not require to be a step in response to the previous limitation. Any node in the SAM tree including the parent node except the publisher node can serve as a child node to its own parent node (see figure 1) and monitor its own QoS degradation, just like what its child node is capable of doing ([0071]);

means for transmitting a complaint to the parent node's parent node in the multicast tree indicating a degradation of quality of service at the parent node in response to determining at the parent node that the quality of service is degraded ([0063], lines 1-15; [0071], lines 10-17. Once a degradation of service is detected at the parent node, it will send a complaint to the publisher node to request to be re-inserted into the SAM tree; the publisher node (root node) is any node including this parent node's parent node).

Novaes et al. discloses the publisher node requesting a list of a set of candidate nodes in response to determining at the parent node that the quality of service is not degraded, wherein

each of the candidate nodes is operable to provide the service to the child node ([0065], when new routing paths are available (in the case no QoS is reported by the parent node), the publisher node is capable of detect a better position for a given subscriber becomes available by re-computing a node placement operation for a given subscriber" where the re-computed parent node and the old parent node constitute a list of parent node to select from for the subscriber node), but does not expressly disclose parent node requesting such a list from a global information table wherein each of the candidate node is physically close to the child node. HPL-2002-281 discloses a mechanism for a node to request a neighboring node list from a global information table wherein each of the node in the list is physically close to the node (page 2, left column, lines 14-27, each node can discover nodes that are physically close; page 6, right col., lines 6-18, subscripting to receive a list of neighboring nodes is a type of requesting a list of neighboring nodes). Banerjee et al discloses an application-layer multicast tree.

At the time of invention, it would have been obvious to a person of ordinary skilled in the art to combine the teachings disclosed by Novaes et al. with the teachings disclosed by HPL-2002-281 and Banerjee et al. The suggestion/motivation would have been to provide a timely fix therefore maintain efficient routes (HPL-2002-281, section 1, lines 55-60).

As to claim 15, Novaes-Banerjee discloses determining whether a cause of the degradation of quality of service is located in an upstream link or is located at a child-parent link comprises:

determining at the parent node whether quality of service associated with the service being received at the child node is degraded (see similar rejection to claim 27 above and Novaes, [0068]. Since when q=2, the parent node monitoring only happens when the degradation of QoS

is detected, therefore by receiving a verification message from the child node using the parent node monitoring mechanism, the parent can determine that the QoS is degraded at the child node if Q=2);

transmitting a complaint to the parent node's parent node in the multicast tree indicating a degradation of quality of service at the parent node in response to determining at the parent node that the quality of service is degraded (Novaes, [0071], lines 10-17; [0063], lines 1-15; the parent node in response to determining at the parent node that the quality of service is degraded, as any subscriber nodes do, will transmit a complaint to publisher node, which is a parent to all subscriber nodes in the SAM tree. It is to be noted that it is not specifically defined which node of the QoS is degraded from the claim language in this limitation. The examiner interprets it as QoS at the parent node).

Novaes-Banerjee, however, does not teach requesting a list of a set of candidate nodes from a global information table in response to determining at the parent node that the quality of service is not degraded, wherein each of the candidate nodes is operable to provide the service to the child node and is physically close to the child node. HPL-2002-281 instead discloses a mechanism to provide above functions (section 1, lines 67-70; section 6, lines 1-3).

At the time of invention, it would have been obvious to a person of ordinary skilled in the art to combine the method disclosed by Novaes-Banerjee, with the method disclosed by HPL-2002-281. The suggestion/motivation would have been to take advantage of the condition of the underlying physical network and effectively utilizes physical proximity information (HPL-2002-281, section 1, lines 5-9), and to achieve both efficiency and accuracy (HPL-2002-281, section 1, line 70).

As to claim 16, HPL-2002-281 discloses requesting a list of a set of candidate nodes from a global information table comprises transmitting location information for the child node to a distributed hash table overlay network storing the global information table (section 1, lines 67-70, 73-82, 91-93).

At the time of invention, it would have been obvious to a person of ordinary skilled in the art to combine the method disclosed by Novaes et al. as modified by Banerjee et al., with the method of selecting candidate nodes disclosed by HPL-2002-281. See similar motivation in claim 15 rejection.

As to claim 17, HPL-2002-281 discloses the global information table includes at least location information and information associated with services provided by nodes in the application layer multicast network (section 1, lines 73-82, 91-93; section 6, lines 1-3).

At the time of invention, it would have been obvious to a person of ordinary skilled in the art to combine the method disclosed by Novaes et al. as modified by Banerjee et al., with the method disclosed by HPL-2002-281. See similar motivation in claim 15 rejection.

As to claim 18, HPL-2002-281 discloses the global information table is stored in a plurality of distributed hash table nodes in the distributed hash table overlay network, such that each distributed hash table node stores information for nodes physically close in an underlying physical network (section 1, lines 73-82, 91-93).

At the time of invention, it would have been obvious to a person of ordinary skilled in the art to combine the method disclosed by Novaes et al. as modified by Banerjee et al., with the method disclosed by HPL-2002-281. See similar motivation in claim 15 rejection.

As to claim 20, HPL-2002-281 et al discloses the global information table stores information for nodes transmitting a complaint, the method comprising: searching the global information table for the set of candidate nodes such that the set of candidate nodes does not include a node that transmitted a complaint (section 1, lines 67-70).

At the time of invention, it would have been obvious to a person of ordinary skilled in the art to combine the method disclosed by Novaes et al. as modified by Banerjee et al., with the method disclosed by HPL-2002-281. See similar motivation in claim 15 rejection.

16. Claims 19 and 28-30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Novaes et al., in view of Banerjee et al., and HPL-2002-281, as applied to claim 18, and further in view of HPL-2002-126R2 by Xu et al ("Turning Heterogeneity into an Advantage in Overlay Routing").

As to claim 19, *HPL-2002-281* discloses requesting a list of a set of candidate nodes from the global information table for the child node (section 1, lines 64-70). However, *HPL-2002-281* does not expressly disclose hashing a landmark vector of the child node to identify a distributed hash table node to transmit the request. HPL-20020126R2 discloses hashing a landmark vector of the node to identify a distributed hash table node (section III A 2, lines 24-27).

At the time of invention, it would have been obvious to a person of ordinary skilled in the art to combine the teachings of Novaes-Banerjee-HPL-*2002-281* regarding requesting a list of a set of candidate nodes from the global information table for the child node with the teachings of HPL-2002-126R2 regarding hashing a landmark vector of the node to identify a distributed hash table node. The suggestion/motivation would have been to establish connections with nodes in

its physical proximity that are situated near network access points such as gateways or routers, that are highly available, and that have good fan-outs and forwarding capacities (HPL-2002-126R2, section III, lines 1-5).

As to claim 28, see similar rejection to claim 19.

As to claim 29, see similar rejection to claim 17.

As to claim 30, see similar rejection to claim 18.

Response to Arguments

17. Applicant's arguments filed on 6/2/2008 have been fully considered but the following arguments are not persuasive. See the following examiner's response for reasons.

Examiner's response

18. Applicant argues the amended claims 31 and 35 reciting a tangible computer readable medium overcomes the current 101 rejection. Examiner disagrees because the specification in paragraph [123] still contains "signal" as part of the computer readable medium. Applicant is suggested to exclude "signal" from the specification and include "computer readable storage medium" in the related claims in order to overcome this 101 rejection.

19. Applicant argues on page 18 that Novaes fails to disclose "the child node measuring and comparing QoS for an upstream link". This limitation is not claimed therefore will not be addressed. See similar note in the previous paragraph of response.

20. Applicant argues on page 18 that Novaes fails to teach or suggest "receiving a complaint from a child node at a parent node in the multicast tree, the complaint indicating a degradation of quality of service of a service being received at the child node". Examiner disagrees because Novaes discloses receiving a complaint from a child node at a parent node in the multicast tree,

the complaint indicating a degradation of quality of service of a service being received at the child node ([0071], lines 10-17; [0063], lines 1-15). As disclosed by Novaes, the publisher node, which is "a parent node in the multicast tree", receives the complaint from a child node, the complaint indicating a degradation of QoS of a service being received at the child node.

21. Applicant asserts on page 20 that none of the claimed features in claim 27 are taught or suggested by the prior art of record, without any arguments. Please see the rejections to these limitations above.

22. The rest of the arguments have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

23. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to HUA FAN whose telephone number is (571)270-5311. The examiner can normally be reached on M-F 7:30am-5pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Bunjob Jaroenchonwanit can be reached on (571) 272-3913. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/H. F./
Examiner, Art Unit 2456

/Bunjob Jaroenchonwanit/
Supervisory Patent Examiner, Art Unit 2456